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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAPANI VUORINEN,
SARI JUUTILAINEN, and
AKI VILPPONEN

Appeal 2008-0095
Application 09/262,912
Technology Center 1700

Decided: March 25, 2008

Before CHUNG K. PAK, CATHERINE Q. TIMM, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's refusal to allow claims 21, 22, 25, 27 through 29, 32 through 35, and 37 through 41, all of the claims pending in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6.

STATEMENT OF THE CASE

The subject matter on appeal is directed to “a method of treating chemical cellulose pulp from an alkaline pulping process in a chlorine dioxide stage which includes an acid treatment at a temperature of over 80°C” (Spec. 1, ll. 3-5). Further details of the appealed subject matter are recited in representative claim 21 reproduced below:

21. A method of treating chemical cellulose pulp from an alkaline pulping process, after cooking and preferably after oxygen delignification, with chlorine dioxide in a first chlorine dioxide stage of an elemental chlorine free bleaching sequence, and of minimizing the use of chlorine dioxide, consisting of the sequential steps,

(a) bleaching the chemical cellulose pulp in a first chlorine dioxide step at a temperature between 80-100°C for less than 10 minutes and so as to provide a chlorine dioxide dosage of between 0.5-1.5 % active chlorine, and adjusting the pH of the pulp in the first chlorine dioxide step so that the final pH of the step is over 4;

(b) effecting an acid treatment of the chemical cellulose pulp from step (a) at a pH of between 2-5 and at a temperature of over 80°C and a time of 30-300 minutes sufficient to remove hexenuronic acids from the pulp, and

(c) bleaching the chemical cellulose pulp from step (b) in a second chlorine dioxide step.

The Examiner has relied upon the following references:

Chang	WO 91/05909	May 2, 1991
Henricson	WO 97/15713	May 1, 1997

The Examiner has rejected claims 21, 22, 25, 27 through 29, 32 through 35, and 37 through 41 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Henricson and Chang.

The Appellants appeal from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).

FACTS, PRINCIPLES OF LAW, ISSUES, AND ANALYSES

Under 35 U.S.C. § 103(a), the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary consideration (e.g., unexpected results). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966). “[A]nalysis [of whether the subject matter of a claim would have been obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007) *quoting In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); *see also DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006)(“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”).

As evidence of obviousness of the subject matter defined by claims 21, 22, 25, 27 through 29, 32 through 35, and 37 through 41 under 35 U.S.C. § 103(a), the Examiner has relied on the combined disclosures of Henricson and Chang. We find that Henricson teaches that:

Chemical pulp has been produced conventionally by first digesting pulp usually with sulphate or sulphite cooking liquor either in a continuous or a batch digestion process, by delignifying and screening the pulp before a bleaching process.

(Henricson 1, ll. 7-12)

The Examiner has also found, and the Appellants have not challenged, that:

Henricson teaches a method of bleaching cellulose pulps using a chlorine-free bleaching sequence, wherein the pulp is subject to an acid treatment within one of the bleaching stages. In particular, the acid treatment can be effected in a chlorine dioxide stage with the object of reducing the consumption of chlorine dioxide in the bleaching step. The method is further characterized in that cellulose pulp is acid treated at a temperature of about 75-130 degrees C and at a pH of about 2-5 to remove at least about 30% of the hexenuronic acid groups in the cellulose pulp and to decrease the kappa number of the pulp by 2-9 units. A retention time of 30-300 minutes is required. See page 3, line 26 to page 4, line 4. The removal of hexenuronic acids results in significant savings in the consumption of bleaching chemicals, such as chlorine dioxide. See page 7, lines 1-13 of Henricson for possible bleaching sequences following alkaline digestion and oxygen delignification (O).

[Compare Ans. 3 with Br. 5-8.]

We find that the bleaching sequences taught by Henricson include, *inter alia*, the claimed chlorine dioxide/acid/chlorine dioxide treatment sequence (OAD-D or AD-D in which AD may be performed in the order DA) (Henricson 7, l. 4 to p.8, l. 21).

The Appellants content that Henricson does not specify the claimed process condition for the first chlorine dioxide stage if the DA-treatment sequence is adopted over AD (Br. 5-6).

The dispositive question is, therefore, whether one of ordinary skill in the art would have been led to employ optimum conditions, such as those claimed, for the first chlorine dioxide bleaching stage in the context of Henricson's chlorine dioxide/acid/chlorine dioxide treatment (DAD) sequence within the meaning of 35 U.S.C. § 103(a). On this record, we answer this question in the affirmative.

Although Henricson specifies the claimed DAD sequence and the optimum acid treatment condition as indicated *supra*, it does not mention any specific conditions for its first and last chlorine dioxide treatment stages. It leaves one of ordinary skill in the art to determine optimum conditions for its first and last chlorine dioxide treatment stages. Moreover, as correctly found by the Examiner at page 6 of the Answer, Chang teaches carrying out its first chlorine dioxide bleaching stage prior to the acid treatment at a pH of between 5 and 10 and a temperature of 55-85°C for a period of 5 to 40 minutes (Ans. 3-4). According to Chang, this process conditions can be employed in any chlorine dioxide “bleaching stage of other three, four, five, six, and seven-stage bleaching sequences” (Chang. 4).

Given the above teachings, we concur with the Examiner that it would have prima facie obvious to employ optimum or workable conditions, including those claimed, in the first chlorine dioxide bleaching stage of Henricson's chlorine dioxide/acid/chlorine dioxide treatment (DAD) sequence. *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980)(“[D]iscovery of

an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955)(“[I]t is not inventive to discover the optimum or workable ranges by routine experimentation.”). The Appellants have not shown that the claimed conditions for Henricson’s first chlorine dioxide bleaching stage are “critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.” *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990).

Accordingly, based on the totality of record, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103(a).

ORDER

In view of the foregoing, the decision of the Examiner is affirmed.

AFFIRMED

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